Modbus Field Bus Module

FBM

Nov.11

FBM 22

Features

- **Surge-protected analogue inputs 10-bit resolution**
- **Outputs individually be switched to ON, OFF, AUTO**
- **Enclosure provides durability i comm. environments**
- **Standard modbus protocol allows up to 254 unique devices on one RS 485 network**

Design Features

The FBM are general purpose input/ output modules for building integrators.

Available in several input/ output configurations, the FBM modules provide convenient termination for field devices and interfacing to your:

- **HVAC**
- **lighting**
- **temperature sensors**
- **other typical building automation applications.**

Each of the analogue inputs can be jumper configured for signals of either 0-5V, 0-10Vdc, 0-20mA or digital contact, sensor 10K, high speed pulses.

The outputs are available in digital contacts 0,5 resp.1 Amp, and 0-10Vdc analogue outputs.

The modules are slave devices that can be easily controlled via RS 485 serial interface using the industry standard Modbus protocol.

Special Features of FBM 22

The FBM 22 has a few special features which the other FBM do not have due to a more advanced CPU.

In on/off mode, inputs 1 through 8 can count pulses up to 1 khz on each channel.

In analogue mode, inputs 1 thru 8 are 12 bits compared to the previous 10 bits, input 9 and 10 remain as 10 bits and slower at pulse counting.

For systemintegratörer there is a significant improvement with larger rom and ram space: 128K versus 64K for the flash space and 3K ram versus 1K of ram space compared to earlier models.

This gives more room for system integrators to add features such as Bacnet, PLC typ logic, logging etc.

Secondly there is the second serial port, curently the port is unused but systemintegrators will be able to use the second port to manage a subnet of local sensors, keypads and displays for example, or use it in repeater mode to extend and isolate the RS 485 main network.

Technical Data

Type	
FBM 16	8 un.**inputs** 0-5Vdc or 0-20mA, Sensor NTC 10K Digital Contact 8 **outputs** 0-10Vdc
FBM 21	8 universal **inputs** 0-5Vdc,0 -20mA Sensor NTC 10K High Speed Pulses <100hz Digital Contact 13 Relay **outputs**
FBM 22	10 universal **inputs** 0-5, 0-10Vdc or 0-20mA, Sensor NTC 10K High Speed Pulses <500hz Digital Contact 8 Relay **outputs** 4 analogue **outputs** 0-10Vdc
FBM 32	32universal **inputs** 0-5V, 0-10Vdc or 0-20mA, Sensor NTC 10K Digital Contact
Operating temperature	-30 ...+70 C
Relay Output	0,5A@125Vac or 1A@30Vdc
Protection	IP31
Power Supply	12-24Vac/dc +/-20% 50-60Hz
Consumption	100mA at 12Vdc
Length of cables	1200m or more
Power supply	12-24 Vac/dc (±10%)
Temperature sensor	10K thermistor +/-0,5C
Guidleines	These products meets the CE-approvals
Material, enclosure	Flame proof plastic

Ordering Code

FBM 16	8 anlogue inputs, 8 analogue outputs
FBM 21	8 analogue inputs, 13 relay outputs
FBM 22	10 analogue inputs, 8 relay outputs, 4 an.O/P
FBM 32	32 analogue inputs

Inputs

Each input of a FBM can be jumper-configured in 1 of 3 ways:

0-5V, 0-10Vdc, 0-20mA, Digital Contact, Pulse and sensor

The value of each input is tored as a 10-bit number in the respective modbus register.

The registrers addresses are as follows:

Input register adresses

Model	Number of Inputs	Register Addresses
FBM 16	8	108-115
FBM 32	32	100-131
FBM 22	10	190-199
FBM 21	8	118-133

A 5Vdc or 20mA, would give a reading of 1024.

Each input has a corresponding LED which will light up if the value of the input is greater than 512.

For more info on reading the input registers, see Serial Comminications.

Outputs

The state of each output is determinded by its corresponding switch position.

The switches have 3 states - ´hand´, off, and auto.

When switched to ´hand´ the corresponding output will be switched on - 10V analogue, contacts closed for relay.

When switched to ´off´ the output will be set to 0V for analogue, open contact for relay.

When switched to ´auto´analogue outputs will be set to the level stored in the corresonding MODBUS output register.

For Digital outputs, a register value 0 is de-activate and register value 1000 is activated.

Output register adresses

Model	Number of Outputs	Register Addresses
FBM 16	8	100-107
FBM 32	0	-
FBM 22	12	100-111
FBM 21	13	100-112

These registers can be changed using the RS485 serial interface.

For analogue outputs, a 0 corresponds to 0V.

Likewise 1 1024 corresponds to 10V.

Outputs (cont...d)

The output registers are stored in RAM, thus contents of each register will be lost upon power-off.

Each output has a corresponding LED which will light up if the value of the output is grater than 512 (5V).

For more information on writing the output registers, see on Serial communications.

Analogue Output Calibration

The FBM has an output calibration feature that allows for an adjustment of +/- 1,28V.

Calibration is controlled voa the calibration register located at register 13.

By default, this is 128, which corresponds to 0V calibration.

A value of 0 would give a -1,28V offset.

A value of 255 would give a +1,28V offset.

It is recommended that the calibration be determined while the output is set to 5V.

The calibration value is located in flash memory and will be restored upon power-up.

Baudrate

All FBM have adjustable Baudrates set by Modbus register 15.

By default baud is set to 19,2kbps

Value 1 will set the baud to 19200bps

Value 0 will set the baud to 9600bps

Accesing FBM Series Registers via Serial Communications.

The FBM modules have a built-in interface for communication over an RS485 network.

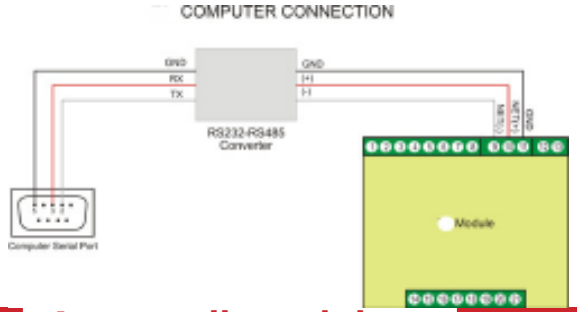
Communicaiton is currently implemented using Modbus protocol.

For detailed information on Modbus Protocol, see chapter entitled Modbus Serial Communications.

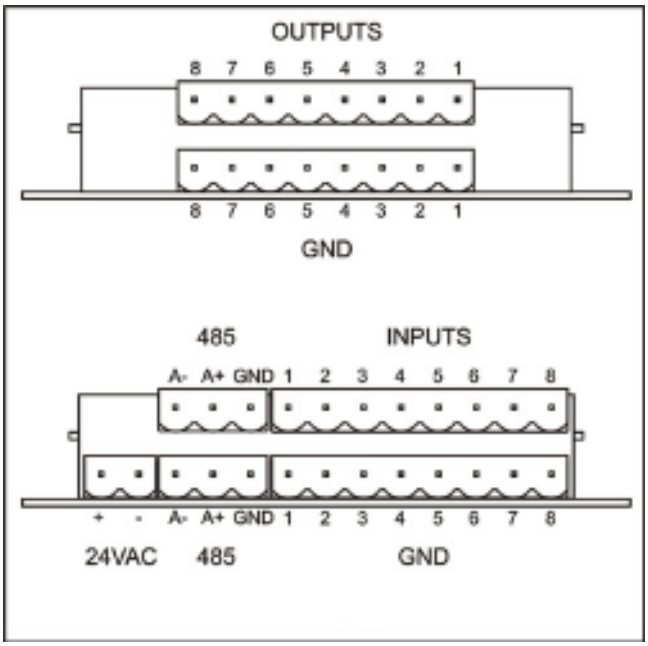
Connecting FBM module to a computer

The FB modules connect to a computer serially via the RS485 interface.

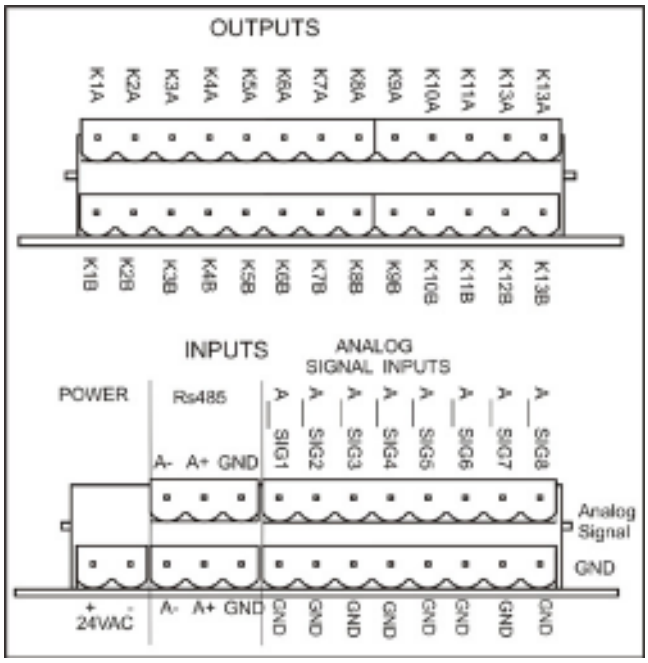
A RS 232 to RS 485 converter is required in order to communicate with a standard PC.



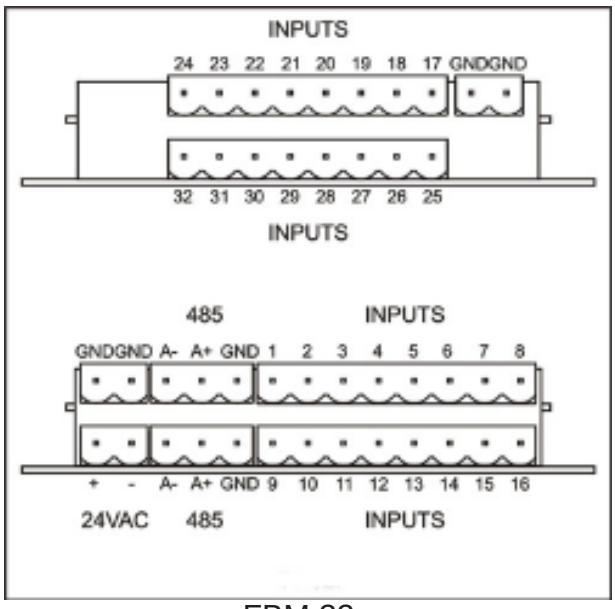
Wiring Diagram



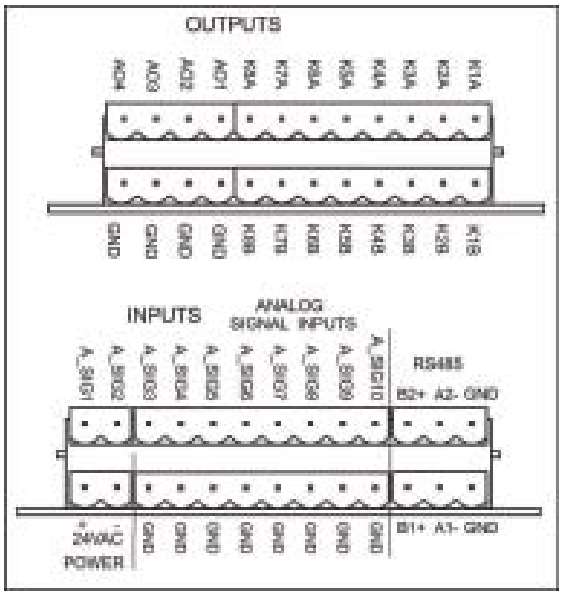
FBM 16



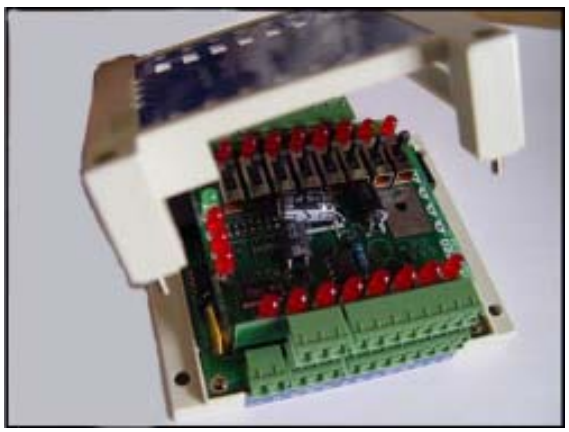
FBM 21

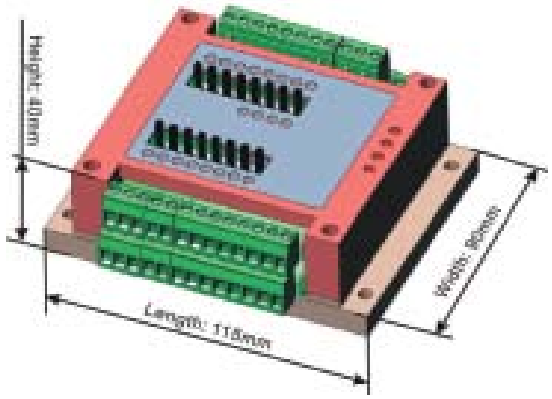


FBM 32

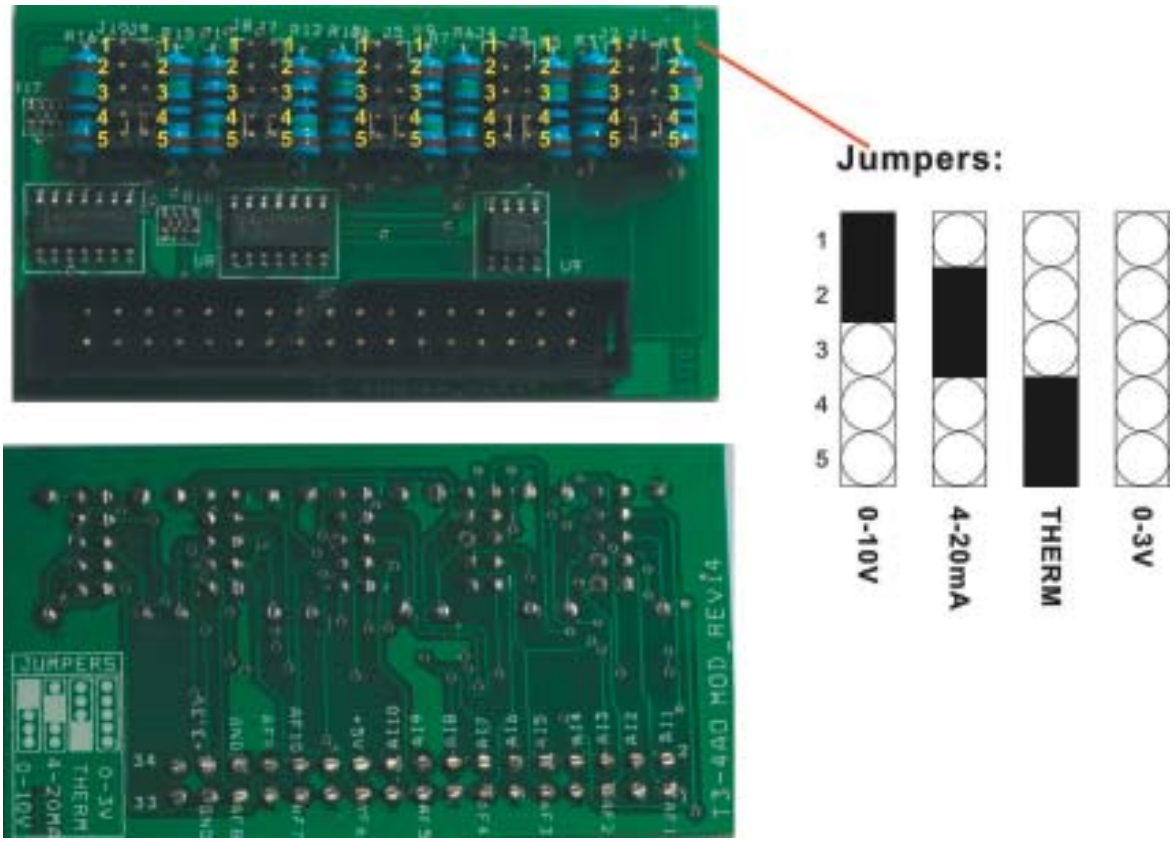


FBM 22





Jumper Settings



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